IB795

VIA Eden/C3 VIA Apollo
PN133T 5.25-inch SBC

USER'S MANUAL

Version 1.0B

Acknowledgments

Award is a registered trademark of Award Software International, Inc.
PS/2 is a trademark of International Business Machines Corporation.
Microsoft Windows is a registered trademark of Microsoft Corporation.
Winbond is a registered trademark of Winbond Electronics Corporation.
All other product names or trademarks are properties of their respective owners.

Table of Contents

This page was intentionally left blank.

Introduction

Product Description

IB795 is a high-performance flexible embedded board based on the VIA ProSavage TwisterT (PN133T) chipset. The chipset is based on an innovative and scaleable architecture with proven reliability. It is a two-chip set consisting of the VT8606 North Bridge Controller and VT82C686B South Bridge Controller.

IB795 supports the VIA Eden/C3 processors that features Native x86 execution, Integrated full-speed 192KB L1/L2 cache, 100/133MHz Front Side Bus, Advanced multimedia instruction set, and MMX™ & 3DNow!™

The VT8606 integrated graphics accelerator supports 8/16/32MB frame buffer using the system memory, integrated 2-channel 110MHz LVDS interface and digital port for NTSC/PAL TV encoder. One or two Ethernets can be supported by the Realtek 8139C single chip Ethernet controller. Additional key features include support for two USB ports, AC-97 link for audio, hardware monitoring, and power management.

The VT8606 integrated graphics accelerator supports 8/16/32MB frame buffer using the system memory, integrated 2-channel 110MHz LVDS interface and digital port for NTSC/PAL TV encoder. One or two Ethernets can be supported by the Realtek 8139C single chip Ethernet controller. Additional key features include support for two USB ports, AC-97 link for audio, hardware monitoring, and power management.

System memory is provided by one 168-pin DIMM socket that accommodates SDRAM with a maximum capacity of 512MB. The Award BIOS facilitates easy system configuration and peripheral setup.

Other advanced features include *DiskOnChip flash disk support*, 16-level watchdog timer, and IrDA interface.

DiskOnChip flash disks are storage devices that have no moving parts and emulate FDD/HDD with Flash/RAM/ROM offering reliable data/program storage and long life span. They are reliable and suitable for industrial or other harsh environments characterized by motion, shock, vibration, adverse temperature, dust and humidity. Other features include faster data access, longer MTBF, lower power consumption, cost effective for small capacity and small form factor.

Checklist

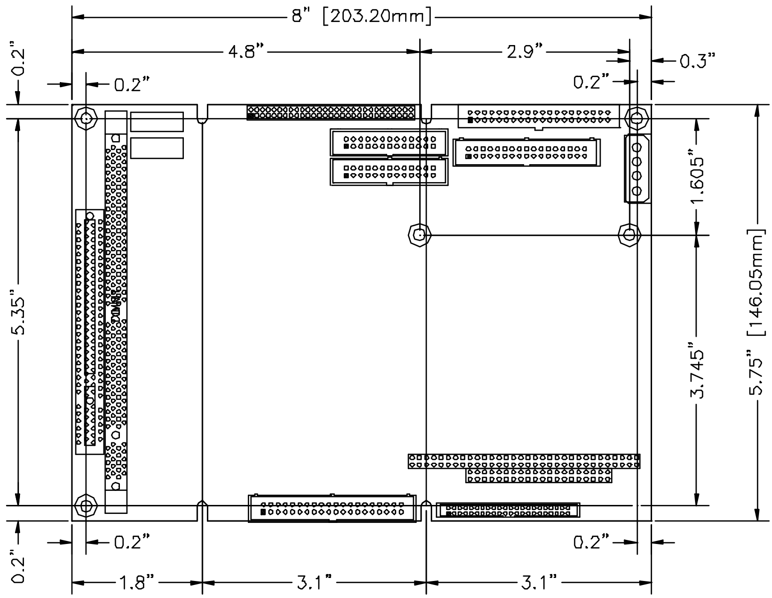
Your IB795 package should include the items listed below.

- The IB795 Embedded Board
- This User’ s Manual
- 1 CD containing chipset drivers and flash memory utility
- Optional cables such as:
  - 1 FDD Ribbon Cable
  - 1 Audio Cable
  - 2 IDE Ribbon Cables (40-pin & 44-pin)
  - 1 COM Port Cable
  - 1 Printer Port Cable
  - 1 PS/2 Keyboard/Mouse Cable
  - 1 VGA Cable
  - IBLD cable bracket for dual Ethernet
  - RJ-45 Cable
  - Single USB Port Cable Bracket

Specifications

Processor Supported	VIA Eden or C3 processors on board 100/133MHz Front Side Bus
Chipset	VIA Apollo PN133T Chipset North bridge: VT8606 (552-pin BGA package) South bridge: VT82C686B (352-pin BGA package)
BIOS	Award BIOS Supports ACPI, DMI, PnP
System Memory	1x DIMM socket supports up to 512MB capacity PC100/PC133 supported
I/O Chipset	VT82C686B chipset Keyboard controller built-in
I/O Features	1x FDD (up to 2.88MB, 3 Mode, LS120) 2x Parallel Port (EPP, ECP Port) 4x Serial Ports (3x RS232 and 1x RS232/422/485) 1x IrDA TX/RX Headers
Bus Master IDE	2x IDE interfaces for up to 4 devices; supports PIO Mode 3/4 or UDMA/33/66/100 HDD, and ATAPI CD-ROM
VGA	VT8606 integrated graphics controller 8/16/32MB frame buffer with system memory Integrated 2-channel 110MHz LVDS interface Digital port for TV encoder
LCD Interface	Supports 36 bit TTL LCD interface and 2 channel LVDS
TV Out (Optional)	VIA VT1621 TV Encoder Composite and S-Video output
Audio	VT82C686B chipset built-in sound controller With AC97 Codec
LAN	One or two Realtek RTL8139C Ethernet controllers 10Base-T / 100Base-TX protocol
USB	2 ports (pin header)
Watchdog Timer	16 levels (0, 2, 4, 6, … 30 sec.)
Hardware Monitoring	Built-in VT82C686B chipset Monitors CPU/system temperature and voltages
DiskOnChip	Support M-Systems 2MB~288MB DiskOnChip flash disk
Digital I/O	4 in, 4 out
Expansion Slot	One 32-bit PCI slot One PC/104 expansion slot
Power Consumption	+5V: 6A max. +12V: 750mA max.
Form Factor	5.25-inch SBC (Little Board)
Dimensions	203mm x 146mm (7.99" x 5.75")

Board Dimensions



Installations

This section provides information on how to use the jumpers and connectors on the IB795 in order to set up a workable system. The topics covered are:

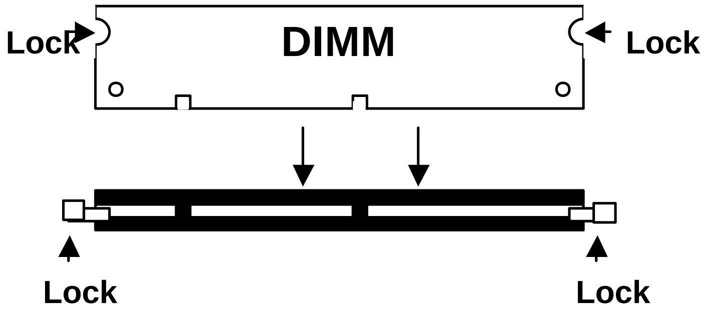
Installing the Memory (DIMM)

The IB795 Embedded Board supports one 168-pin DIMM socket for a maximum total memory of 512MB in SDRAM type. The memory module capacities supported are 64MB, 128MB, 256MB, and 512MB.

Installing and Removing DIMMs

To install the DIMM, locate the memory slot on the Embedded Board and perform the following steps:

1. Hold the DIMM so that the two keys of the DIMM align with those on the memory slot.
2. Gently push the DIMM in an upright position until the clips of the slot close to hold the DIMM in place when the DIMM touches the bottom of the slot.
3. To remove the DIMM, press the clips with both hands.

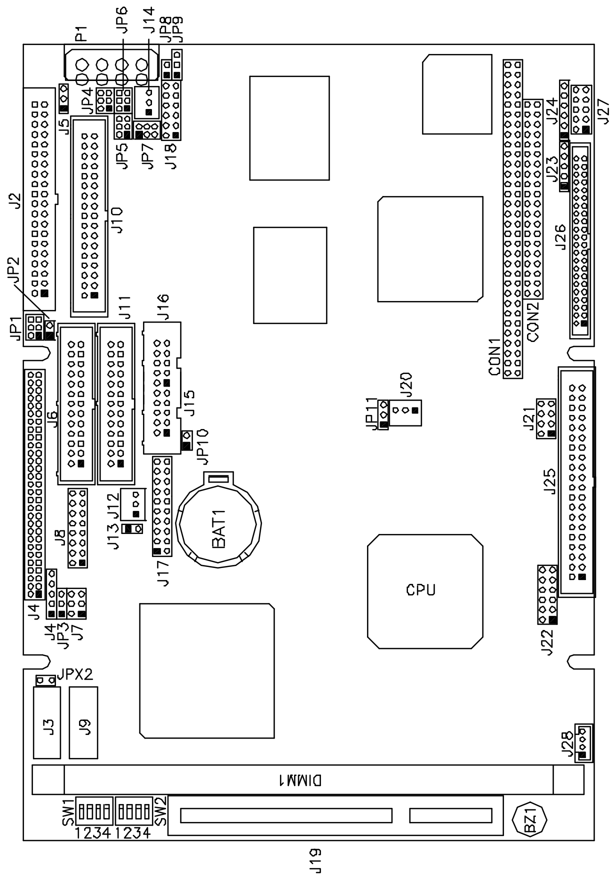


Top View of DIMM Socket

Setting the Jumpers

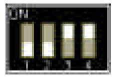
Jumpers are used on IB795 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on IB795 and their respective functions.

Jumper Locations on IB795



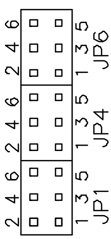
Jumpers on IB795
SW1(3): CPU Bus Speed Selector
JP1, JP4, JP6: RS232/422/485 (COM2) Selection
JPX2: TV Output Selection
JP2: LAN1 Enable/Disable
JP3: LCD Power Setting
JP5: COM3/4 RS232 +5V / +12V Power Setting
JP7: COM1/2 RS232 +5V / +12V Power Setting
JP8: LAN2 Enable/Disable
JP9: DiskOnChip Address Select
JP10: AT/ATX Power Selection
JP11: Clear CMOS Content

SW1(3): CPU Bus Speed Selector

Bus Speed	SW1(3)	Switch Setting
66MHz		off off on on
100MHz		off off off on
133MHz		off off off off

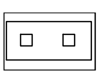
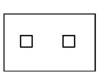
JP1, JP4, JP6: RS232/422/485 (COM2) Selection

COM1 is fixed for RS-232 use only.
COM2 is selectable for RS232, RS-422 and RS-485.
The following table describes the jumper settings for COM2 selection.

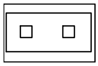
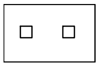


COM2 Function	RS-232	RS-422	RS-485
Jumper Setting (pin closed)	JP1: 3-5 & 4-6 JP4: 3-5 & 4-6 JP6: 1-2	JP1: 1-3 & 2-4 JP4: 1-3 & 2-4 JP6: 3-4	JP1: 1-3 & 2-4 JP4: 1-3 & 2-4 JP6: 5-6

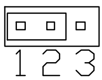
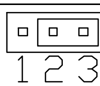
JPX2: TV Output Selection

JPX2	Setting	TV Output
	Short/Closed	TV Output
	Open	LCD Output

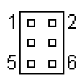
JP2: LAN1 Enable/Disable

JP2	Setting	LAN1
	Short/Closed	Enabled
	Open	Disabled

JP3: LCD Power Setting

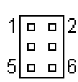
JP3	Setting	Function
	Pin 1-2 Short/Closed	3.3V
	Pin 2-3 Short/Closed	5V

JP5: COM3/4 RS232 +5V / +12V Power Setting

Pin #	Signal Name	JP5	Signal Name	Pin #
1	+5V		+5V	2
3	Pin 9 (COM3)		Pin 9 (COM4)	4
5	+12V		+12V	6

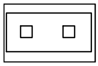
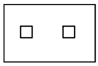
COM3 Settings: Pin 1-3 short = +5V, Pin 3-5 short = +12V
COM4 Settings: Pin 2-4 short = +5V, Pin 4-6 short = +12V

JP7: COM1/2 RS232 +5V / +12V Power Setting

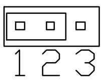
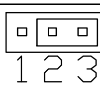
Pin #	Signal Name	JP7	Signal Name	Pin #
1	+5V		+5V	2
3	Pin 9 (COM1)		Pin 9 (COM2)	4
5	+12V		+12V	6

COM1 Settings: Pin 1-3 short = +5V, Pin 3-5 short = +12V
COM2 Settings: Pin 2-4 short = +5V, Pin 4-6 short = +12V

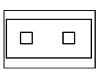
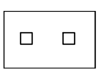
JP8: LAN2 Enable/Disable

JP8	Setting	LAN2
	Short/Closed	Enabled
	Open	Disabled

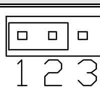
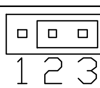
JP9: DiskOnChip Address Select

JP9	Setting	Address
	Pin 1-2 Short/Closed	D0000-D7FF
	Pin 2-3 Short/Closed	D8000-DFFF

JP10: AT/ATX Power Selection

JP10	Setting	AT / ATX Power
	Short/Closed	Select ATX Power
	Open	Select AT Power

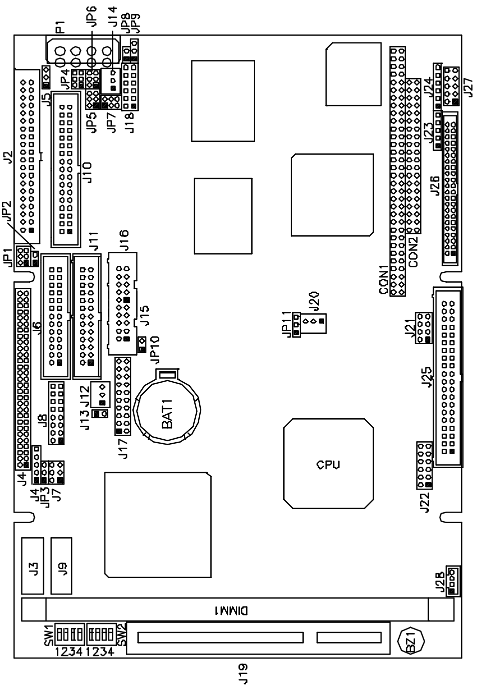
JP11: Clear CMOS Content

JP11	Setting	Function
	Pin 1-2 Short/Closed	Normal Operation
	Pin 2-3 Short/Closed	Clear CMOS Content

Connectors on IB795

The connectors on IB795 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on IB795 and their respective functions.

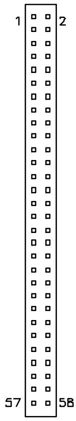
Connector Locations on IB795



J1: LCD Panel Connector
J2, JB2, JC2, JD2: Serial Ports
J3: 1st Channel LVDS Connector (DF13-20)
J4: LCD Inverter Output
J6: Secondary Parallel Port Connector
J7: TV-Out Connector
J8: VGA CRT Connector
J9: 2nd Channel LVDS Connector (DF13-20)
J10: Floppy Drive Connector
J11: Primary Parallel Port Connector
J12: System Fan Power Connector
J14: External ATX Power Connector
J15, J16: LAN1, LAN2 Connector
J17: System Function Connector
J18: Digital I/O
J20: CPU Fan Power Connector
J21: USB Connector
J22: Audio Connector
J23: IrDA Connector
J24: External Keyboard Connector
J25, J26: Primary and Secondary IDE Connectors
J27: PS/2 Keyboard/Mouse Connector
J28: CD-in Connector

J1: LCD Panel Connector

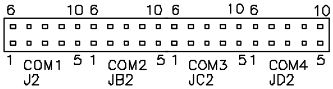
J1 is the TTL interface pin header for flat panel LCD displays. The following shows the pin assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
+12V	1	2	+12V
Ground	3	4	Ground
5V/3.3V	5	6	5V/3.3V
ENAVEE	7	8	Ground
P0	9	10	P1
P2	11	12	P3
P4	13	14	P5
P6	15	16	P7
P8	17	18	P9
P10	19	20	P11
P12	21	22	P13
P14	23	24	P15
P16	25	26	P17
P18	27	28	P19
P20	29	30	P21
P22	31	32	P23
Ground	33	34	Ground
SHFCLK	35	36	FLM
MDE	37	38	LP
Ground	39	40	ENABKL
Ground	41	42	NC
DNAVDD	43	44	5V/3.3V
NC	45	46	NC
P24	47	48	P25
P26	49	50	P27
P28	51	52	P29
P30	53	54	P31
P32	55	56	P33
P34	57	58	P35

J2, JB2, JC2, JD2: Serial Ports

J2 (COM1), JB2 (COM2), JC2 (COM3) and JD2 (COM4) are the onboard serial ports on the IB795.

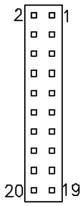


Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	Ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	No Connect.

JB2 (COM2) is jumper selectable for RS-232, RS-422 and RS-485.

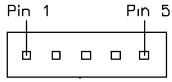
Pin #	Signal Name		
	RS-232	**R2-422**	**RS-485**
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC

J3, J9: 1st and 2nd Channel LVDS Connector (DF13-20)



Signal Name	Pin #	Pin #	Signal Name
TX0-	2	1	TX0+
Ground	4	3	Ground
TX1-	6	5	TX1+
5V/3.3V	8	7	Ground
NC	10	9	NC
TX2-	12	11	TX2+
Ground	14	13	Ground
TXC-	16	15	TXC+
5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

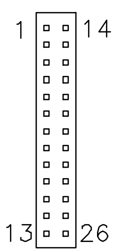
J4: LCD Inverter Output



Pin #	Signal Name
1	+12V
2	Ground
3	ENVEE
4	NC
5	Vcc

J6: Secondary Parallel Port Connector

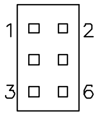
The following table describes the pin out assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

J7: TV-Out Connector

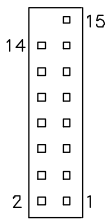
J7 is a 6-pin header for the optional TV-Out connector.



Signal Name	Pin #	Pin #	Signal Name
Comp	1	2	Ground
S-Y	3	4	Ground
S-C	5	6	Ground

J8: VGA CRT Connector

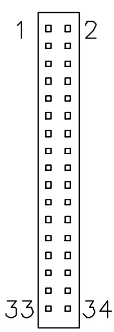
J8 is a 15-pin header for an external VGA CRT female connector.



Signal Name	Pin	Pin	Signal Name
Red	1	2	Vcc
Green	3	4	Ground
Blue	5	6	N.C.
N.C.	7	8	N.C.
Ground	9	10	H-Sync
Ground	11	12	V-Sync
Ground	13	14	N.C.
Ground	15	16	N.C.

J10: Floppy Drive Connector

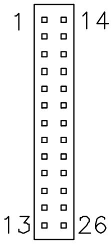
J10 is a 34-pin header and will support up to 2.88MB floppy drives.



Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	RM/LC
Ground	3	4	No connect
Ground	5	6	No connect
Ground	7	8	Index
Ground	9	10	Motor enable 0
Ground	11	12	Drive select 1
Ground	13	14	Drive select 0
Ground	15	16	Motor enable 1
Ground	17	18	Direction
Ground	19	20	Step
Ground	21	22	Write data
Ground	23	24	Write gate
Ground	25	26	Track 00
Ground	27	28	Write protect
Ground	29	30	Read data
Ground	31	32	Side 1 select
Ground	33	34	Diskette change

J11: Primary Parallel Port Connector

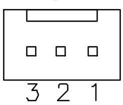
The following table describes the pin out assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

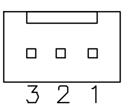
J12: System Fan Power Connector

J12 is a 3-pin header for the system fan. The fan must be a 12V fan.



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

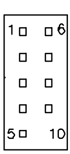
J14: External ATX Power Connector



Pin #	Signal Name
1	Ground
2	PS-ON (soft on/off)
3	5VSB (Standby +5V)

J15, J16: LAN1, LAN2 Connector

J15 and J16 are the first and second LAN connectors for RJ45 cables.

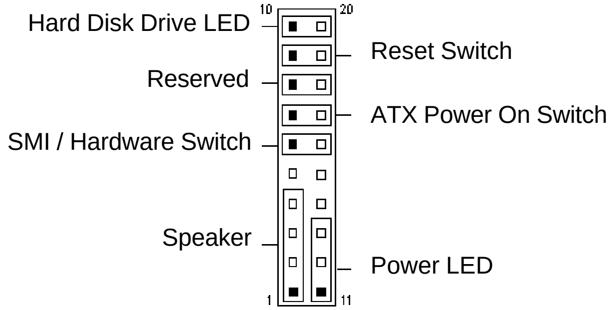


Signal Name	Pin #	Pin #	Signal Nam
LED1+	1	6	LED1-
RX+	2	7	RX-
LED2-	3	8	Ground
LED2+	4	9	Ground
TX+	5	10	TX-

Note: LED 1: Active LED; LED2: Link LED

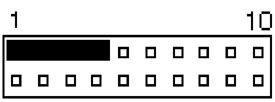
J17: System Function Connector

J17 provides connectors for system indicators that provide light indication of the computer activities and switches to change the computer status. J17 is a 20-pin header that provides interfaces for the following functions.



Speaker: Pins 1 - 4

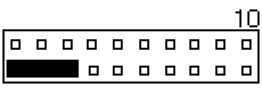
This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.



Pin #	Signal Name
1	Speaker out
2	No connect
3	Ground
4	+5V

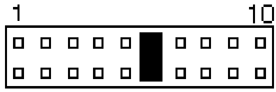
Power LED: Pins 11 - 13

The power LED indicates the status of the main power switch.



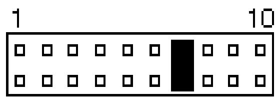
Pin #	Signal Name
11	Power LED
12	No connect
13	Ground

SMI/Hardware Switch: Pins 6 and 16
This connector supports the "Green Switch" on the control panel, which, when pressed, will force the system into the power-saving mode immediately.

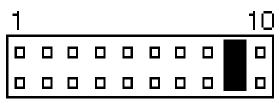


Pin #	Signal Name
6	Sleep
16	Ground

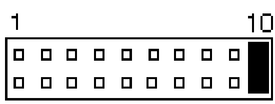
ATX Power ON Switch: Pins 7 and 17
This 2-pin connector is an “ATX Power Supply On/Off Switch” on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.



Reset Switch: Pins 9 and 19
The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.



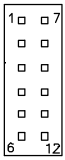
Hard Disk Drive LED Connector: Pins 10 and 20
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



Pin #	Signal Name
10	Ground
20	5V

J18: Digital I/O Connector (4 in, 4 out)

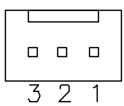
This 12-pin Digital I/O connector supports TTL levels and is used to control external devices requiring ON/OFF circuitry.



Signal Name	Pin #	Pin #	Signal Name
In0	1	7	+5V
In1	2	8	Out0
In2	3	9	Ground
In3	4	10	Out1
Ground	5	11	+12V
Out2	6	12	Out3

J20: CPU Fan Power Connector

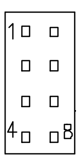
J20 is a 3-pin header for the CPU fan power.



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

J21: USB Connector

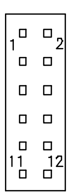
J21 supports an external USB connector with two ports.



Pin #		Signal Name
1	5	Vcc
2	6	USB-
3	7	USB+
4	8	Ground

J22: Audio Connector

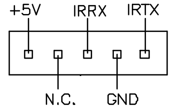
J22, a 12-pin header connector, supports an optional external connector supporting 3 sockets for Line Out, Line In and Mic functions. The following table shows the pin assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Line Out R	1	2	Line Out L
Ground	3	4	Ground
Line In R	5	6	Line In L
Ground	7	8	Ground
Mic	9	10	BIAS
Ground	11	12	NC

J23: IrDA Connector

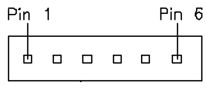
J23 is used for an optional IrDA connector for infrared wireless communication.



Pin #	Signal Name
1	+5V
2	No connect
3	Ir RX
4	Ground
5	Ir TX

J24: External Keyboard Connector

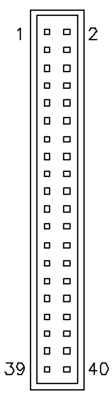
J24 is a a 5-pin header for the external keyboard connector.



Pin #	Signal Name
1	+5V
2	KBCLK-OUT
3	KBCLK-IN
4	KBDAT-OUT
5	KBDAT-IN
6	Ground

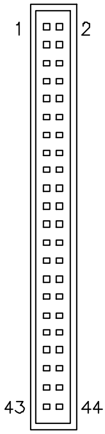
J25, J26: Primary and Secondary IDE Connectors

J25: Primary IDE Connector



Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Protect pin
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

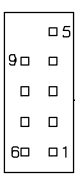
J26: Secondary IDE Connector



Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground
Vcc	41	42	Vcc
Ground	43	44	N.C.

J27: PS/2 Keyboard/Mouse Connector

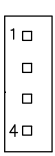
J27, a 10-pin header connector, has functions for keyboard and mouse.



Signal Name	Pin #	Pin #	Signal Name
N.C.	10	5	N.C.
KB clock	9	4	Mouse clock
KB data	8	3	Mouse data
Vcc	7	2	Vcc
Ground	6	1	Ground

J28: CD-in Connector

J28 is the 4-pin CD-in connector.



Pin #	Signal Name
1	Right
2	Ground
3	Ground
4	Left

Watchdog Timer Configuration

The function of the watchdog timer is to reset the system automatically and is defined at I/O port 0443H. To enable the watchdog timer and allow the system to reset, write I/O port 0443H. To disable the timer, write I/O port 0441H for the system to stop the watchdog function. The timer has a tolerance of 20% for its intervals.

The following describes how the timer should be programmed.

Enabling Watchdog:

```
MOV AX, 000FH (Choose the values from 0)
MOV DX, 0443H
OUT DX, AX
```

Disabling Watchdog

```
MOV AX, 00FH (Any value is fine.)
MOV      DX, 0441H
OUT DX, AX
```

WATCHDOG TIMER CONTROL TABLE

Level	Value	Time/sec	Level	Value	Time/sec
1	F	0	9	7	16
2	E	2	10	6	18
3	D	4	11	5	20
4	C	6	12	4	22
5	B	8	13	3	24
6	A	10	14	2	26
7	9	12	15	1	28
8	8	14	16	0	30

BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the Embedded Board. The topics covered in this chapter are as follows:

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel Pentium II/III processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press <DEL> to Enter Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Phoenix - AwardBIOS CMOS Setup Utility

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type…	

The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section which displays information on the currently highlighted item in the list.

Note: *If the system cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

Warning: *It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the board is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Tue, Mar 26 2000	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level
IDE Primary Master	Press Enter 13020 MB	Change the day, month,
IDE Primary Slave	Press Enter None	Year and century
IDE Secondary Master	Press Enter None	
IDE Secondary Slave	Press Enter None	
Drive A	1.44M, 3.5 in.	
Drive B	None	
Halt On	All, But Keyboard	
Select Display Device	CRT + LCD	
Base Memory	640K	
Extended Memory	129024K	
Total Memory	130048K	

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day :	**Sun to Sat**
Month :	**1 to 12**
Date :	**1 to 31**
Year :	**1994 to 2079**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is:

Hour	**:**	**00 to 23**
Minute	**:**	**00 to 59**
Second	**:**	**00 to 59**

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

IDE Primary HDDs / IDE Secondary HDDs

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select 'Manual' to define the drive information manually. You will be asked to enter the following items.

CYLS :	Number of cylinders
HEAD :	Number of read/write heads
PRECOMP :	Write precompensation
LANDZ :	Landing zone
SECTOR :	Number of sectors

The Access Mode selections are as follows:

Auto	
Normal	(HD < 528MB)
Large	(for MS-DOS only)
LBA	(HD > 528MB and supports Logical Block Addressing)

Drive A / Drive B

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all others.

Select Display Device

The options for this field are Auto, CRT, LCD, CRT+LCD, TV, and CRT+TV.

Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

		ITEM HELP
Virus Warning	**Disabled**	Menu Level
CPU Internal Cache	Enabled	
External Cache	Enabled	
CPU L2 Cache ECC Checking	Enabled	Allows you choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
Processor Number Feature	Enabled	
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	
Second Boot Device	HDD-0	
Third Boot Device	CDROM	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Disabled	
Boot Up Numlock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
OS Select For DRAM>64MB	Non-OS2	
Report no FDD for Win95	Yes	
Video BIOS Shadow	Enabled	
C8000-CBFFF Shadow	: Disabled	
CC000-CFFFF Shadow	: Disabled	
D0000-D3FFF Shadow	: Disabled	
D4000-D7FFF Shadow	: Disabled	
D8000-DBFFF Shadow	: Disabled	
DC000-DFFF Shadow	: Disabled	
Small Logo (EPA) Show	: Enabled	

Virus Warning

This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

CPU Internal Cache / External Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. By default, these items are ***Enabled***.

CPU L2 Cache ECC Checking

This field enables or disables the ECC (Error Correction Checking) checking of the CPU level-2 cache. The default setting is ***Enabled***.

Processor Number Feature

When enabled, this feature allows external systems to detect the processor number/type of the CPU.

Quick Power On Self Test

When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

First/Second/Third Boot Device

These fields determine the drive that the system searches first for an operating system. The options available include *Floppy*, *LS/ZIP*, *HDD-0*, *SCSI*, *CDROM*, *HDD-1*, *HDD-2*, *HDD-3*, *LAN* and *Disable*.

Boot Other Device

These fields allow the system to search for an operating system from other devices other than the ones selected in the First/Second/Third Boot Device.

Swap Floppy Drive

This item allows you to determine whether or not to enable Swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to ***Disabled.***

Boot Up Floppy Seek

When enabled, the BIOS will seek whether or not the floppy drive installed has 40 or 80 tracks. 360K type has 40 tracks while 760K, 1.2M and 1.44M all have 80 tracks.

Boot Up NumLock Status

This allows you to activate the NumLock function after you power up the system.

Gate A20 Option

This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

Typematic Rate Setting

When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

Typematic Rate (Chars/Sec)

When the typematic rate is enabled, the system registers repeated keystrokes speeds. Settings are from 6 to 30 characters per second.

Typematic Delay (Msec)

When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

Security Option

This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System,* the system prompts for the User Password every time you boot up. When you select *Setup,* the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

OS Select for DRAM > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is ***Non-OS/2***.

Report No FDD For WIN 95

If you are using Windows 95/98 without a floppy disk drive, select Enabled to release IRQ6. If you set this feature to Disabled, the BIOS will not report the missing floppy drive to Win95/98.

Video BIOS Shadow

This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

C8000 - CBFFF Shadow/DC000 - DFFFF Shadow

Shadowing a ROM reduces the memory available between 640KB to 1024KB. These fields determine whether or not optional ROM will be copied to RAM.

Small Logo (EPA) Show

This field enables the showing of the EPA logo located at the upper right of the screen during boot up.

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

		ITEM HELP
DRAM Timing By SPD	Enabled	
Memory Hole	Disabled	Menu Level
P2C/C2P Concurrency	Enabled	
System BIOS Cacheable	Disabled	
Video BIOS Cacheable	Disabled	
Frame Buffer Size	8M	
AGP Aperture Size	64M	
AGP-4X Mode	Enabled	
AGP Driving Control	Auto	
Panel Type	07	
Boot Device Select	Both	
Power Supply Type	AT	
OnChip USB	Enabled	
USB Keyboard Support	Disabled	
OnChip Sound	Auto	
CPU to PCI Write Buffer	Enabled	
PCI Dynamic Bursting	Enabled	
PCI Master 0 WS Write	Enabled	
PCI Delay Transaction	Disabled	
PCI#2 Access #1 Retry	Enabled	
AGP Master 1 WS Write	Disabled	
AGP Master 1 WS Read	Disabled	

DRAM Timing by SPD

This field enables or disables the DRAM Timing based on SPD.

Memory Hole

It is recommended to leave as disabled, although enabling 15M-16M can help with sound issues.

P2C / C2P Concurrency

Set to Disabled for best performance. You may set this to Enabled if you want any sort of system stability.

System BIOS Cacheable

The setting of *Enabled* allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video BIOS Cacheable

The Setting *Enabled* allows caching of the video BIOS ROM at C0000h-F7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

Frame Buffer Size
The default setting of the frame buffer size is 8M.

AGP Aperture Size
The field sets aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The default setting is ***64M***.

AGP-4X Mode
The field enables or disables the AGP-4X mode of the integrated VGA function.

AGP Driving Control
This BIOS function allows you to adjust the control of the AGP driving force. It is set to Auto by default.

Panel Type
This field sets the panel type that is supported by the system. Below are the selections for the different panel types:

Panel Type 0	640x480	18bit	TFT
1	800x600	18bit	TFT
2	1024x768	36bit	TFT
3	1280x1024	36bit	TFT
4	640x480	16bit	DSTN
5	800x600	16bit	DSTN
6	1024x768	16bit	DSTN
7	1024x768	18bit	1CH LVDS
8	640x480	18bit	TFT
9	800x600	18bit	TFT
A	1024x768	18bit	TFT
B	1280x1024	18bit	TFT
C	1400x1050	36bit	2CH LVDS
D	800x600	16bit	DSTN
E	1024x768	16bit	DSTN
F	1280x1024	16bit	DSTN

OnChip USB
The default setting is Enabled to enable the USB function on board.

Power Supply Type
Select AT or ATX depending on the type of power supply that is used.

OnChip Keyboard Support
Enable this if you are using a USB keyboard.

OnChip Sound
This field can be set as Auto or disabled.

CPU to PCI Write Buffer
This controls the CPU write buffer to the PCI bus. If this buffer is disabled, the CPU writes directly to the PCI bus. The default setting is ***Enabled***.

PCI Dynamic Bursting
This option controls the PCI write buffer. If this is enabled, then every write transaction on the PCI bus goes straight to the write buffer. Burst transactions are then sent on their way as soon as there are enough to send in a single burst.

PCI Master 0 WS Write
This function determines whether there's a delay before any writes to the PCI bus. If this is enabled, then writes to the PCI bus are executed immediately (with zero wait states), as soon as the PCI bus is ready to receive data. But if it is disabled, then every write transaction to the PCI bus is delayed by one wait state. It's recommended to enable this for faster PCI performance.

PCI Delay Transaction
The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select *Enabled* to support compliance with PCI specification version 2.1.

PCI#2 Access #1 Retry
This BIOS feature is linked to the CPU to PCI Write Buffer. Normally, the CPU to PCI Write Buffer is enabled. All writes to the PCI bus are, as such, immediately written into the buffer, instead of the PCI bus. This frees up the CPU from waiting till the PCI bus is free. The data are then written to the PCI bus when the next PCI bus cycle starts.

AGP Master 1 WS Write/Read
When enabled a single wait state is used when writing/reading to the AGP bus. When disabled a 2 wait state is used. For optimal performance set this to enabled. For improved stability set it to disabled.

Integrated Peripherals

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

On-Chip IDE Channel 0	Enabled	ITEM HELP
On-Chip IDE Channel 1	Enabled	Menu Level
IDE Prefetch Mode	Enabled	
IDE Primary Master PIO	Auto	
IDE Primary Slave PIO	Auto	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
Init Display First	PCI Slot	
IDE HDD Block Mode	Enabled	
Onboard FDD Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART 2 Mode	Standard	
Onboard Parallel Port	378/IRQ7	
Onboard Parallel Mode	Normal	
ECP Mode Use DMA	3	
Parallel Port EPP Type	EPP 1.9	
Onboard Serial Port 3	3E8H	
Serial Port 3 Use IRQ	IRQ10	
Onboard Serial Port 4	2E8H	
Serial Port 4 Use IRQ	IRQ11	
Onboard Parallel Port 2	Disabled	
Chip Select Pin	Disabled	
Onboard Legacy Audio	Disabled	

OnChip IDE Channel 0 / 1

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.

IDE Prefetch Mode

These field enables/disables the prefetch buffers in the PCI IDE controller. The prefetch buffers are used as a temporary storage place as data is transferred from one location to another.

IDE Primary/Secondary Master/Slave PIO

These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA

These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

Init Display First

This field allows the system to initialize first the VGA card on chip or the display on the PCI Slot. By default, the *PCI Slot* VGA is initialized first.

IDE HDD Block Mode

This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

Onboard FDD Controller

Select *Enabled* if your system has a floppy disk controller installed on the Embedded Board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. This option allows you to select the onboard FDD port.

Onboard Serial/Parallel Port

These fields allow you to select the onboard serial and parallel ports and their addresses. The default values for these ports are:

Serial Port 1	3F8/IRQ4
Serial Port 2	2F8/IRQ3
Serial Port 3	3E8H/IRQ10
Serial Port 4	2E8H/IRQ11
Parallel Port	378H/IRQ7

UART 2 Mode

This item allows you to determine which Infra Red (IR) function of onboard I/O chip. The options are *Standard*, *IrDA*, and *ASKIR*.

Parallel Port Mode

This field allows you to determine parallel port mode function.

SPP	Standard Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port

Onboard Legacy Audio

Enable or disable the on board legacy audio with this option. If enabled, some audio options will appear.

Power Management Setup

The Power Management Setup allows you to save energy of your system effectively.

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

		ITEM HELP
ACPI Function	Disabled	Menu Level
Power Management	Press Enter	
PM Control by APM	Yes	
Video Off Option	Suspend -> Off	
Video Off Method	V/H Sync + Blank	
Modem Use IRQ	3	
Soft-Off by PWRBTN	Instant-Off	
Thermal Duty Cycle	Disabled	
Wake Up Events	Press Enter	

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

		ITEM HELP
Power Management	User Define	Menu Level
HDd Power Down	Disabled	
Doze Mode	Disabled	
Suspend Mode	Disabled	

Phoenix - AwardBIOS CMOS Setup Utility
IRQ/Event Activity Detect

		ITEM HELP
VGA	OFF	Menu Level
LPT & COM	LPT / COM	
HDD & FDD	ON	
PCI Master	OFF	
PowerOn by PCI Card	Disabled	
Modem Ring Resume	Disabled	
RTC Alarm Resume	Disabled	
IRQs Activity Monitoring	**Press Enter**	

Phoenix - AwardBIOS CMOS Setup Utility
IRQs Activity Monitoring

		ITEM HELP
IRQ3	Disabled	Menu Level
IRQ4	Enabled	
IRQ5	Enabled	
IRQ6	Enabled	
IRQ7	Enabled	
IRQ8	Disabled	
IRQ8	Disabled	
IRQ10	Disabled	
IRQ11	Disabled	
IRQ12	Enabled	
IRQ13	Enabled	
IRQ14	Enabled	
IRQ15	Disabled	

ACPI Function

Use this option to enable or disable the ACPI function

Power Management

When you press Enter while selecting this field, the menu for Power Management appears. The following are the fields in this menu.

Power Management

This field allows you to select the type of power saving management modes. There are four selections for Power Management.

Min. Power Saving	Minimum power management
Max. Power Saving	Maximum power management.
User Define (Default)	Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min.

Under this option, you can also configure other features such HDD Power Down, Doze Mode and Suspend Mode.

HDD Power Down

After the selected period of drive inactivity, the hard disk drive powers down while all other devices remain active. Control of this mode is independent of the Power Management mode selected previously.

Doze Mode

After the selected period of system inactivity, the CPU clock runs at slower speed while all other devices still operate at full speed.

Suspend Mode

This option decides when to shutdown video for power saving. You can select it as always on or turn off video when system enters suspend mode.

PM Control by APM

If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings.

Video Off Option

This option decides when to shutdown video for power saving. You can select it as always on or turn off video when system enters suspend mode.

Video Off Method

This field defines the Video Off features. There are three options.

V/H SYNC + Blank	Default setting, blank the screen and turn off vertical and horizontal scanning.
DPMS	Allows the BIOS to control the video display card if it supports the DPMS feature.
Blank Screen	This option only writes blanks to the video buffer.

Modem Use IRQ

This field sets the IRQ used by the Modem. By default, the setting is ***3***.

Soft-Off by PWRBTN

This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds. The default value is ***Instant Off***.

Thermal Duty Cycle

This field enables or disables the thermal duty cycle.

Wake Up Events

The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events which can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

PNP/PCI Configurations

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

		ITEM HELP
PNP OS Install	No	
Reset Configuration Data	Disabled	Menu Level
Resources Controlled By	Manual	Default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot
IRQ Resources	Press Enter	
DMA Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	
Assign IRQ for VGA	Enabled	
Assign IRQ for USB	Enabled	

PNP OS Install

Enable the PNP OS Install option if it is supported by the operating system installed. The default value is ***No***.

Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled.***

Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices automatically with the use of a use a PnP operating system such as Windows 95.

PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

Assign IRQ for VGA/USB

By default, this fields are Enabled.

PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

		ITEM HELP
CPU Warning Temperature	Disabled	
Current CPU Temp.	34°C/95°F	
Current System Temp.	28°C/82°F	
CPU Fan Speed (FAN1)	4166 RPM	
System Fan Speed (FAN2)	0 RPM	
Vcore (V)	1.45V	
2.5V	2.47V	
3.3(V)	3.34V	
5(V)	5.05V	
12(V)	12.09V	

CPU Warning Temperature

This field sets the temperature threshold that when reached, the system would give an audible warning.

Temperatures/Fan Speeds/Voltages

These fields are the parameters of the hardware monitoring function feature of the Embedded Board. The values are read-only values as monitored by the system and show the PC health status.

Frequency/Voltage Control

This section shows the user how to configure the processor frequency.

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

		ITEM HELP
Auto Detect DIMM/PCI Clk	Disabled	Menu Level
Spread Spectrum	Disabled	
Host CPU/PCI Clock	Default	

Auto Detect DIMM/PCI Clk

This field enables or disables the auto detection of the DIMM/PCI clock. The default setting is ***Disabled***.

Spread Spectrum

This field sets the value of the spread spectrum. The default setting is ***Disabled***. This field is for CE testing use only.

Host CPU/PCI Clock

The Host CPU/PCI Clock has a default setting of ***Default*** which automatically detects the systems host CPU clock and PCI clock. You can also use this parameter to overclock your system. However, it is important to note that overclocking the system/CPU can cause your system to become unstable or crash.

Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

Load Setup Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

Set Supervisor/User Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type “Y”, you will quit the setup utility and save all changes into the CMOS memory. If you type “N”, you will return to Setup utility.

Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing “Y” will quit the Setup utility without saving the modifications. Typing “N” will return you to Setup utility.

This page is intentionally left blank.

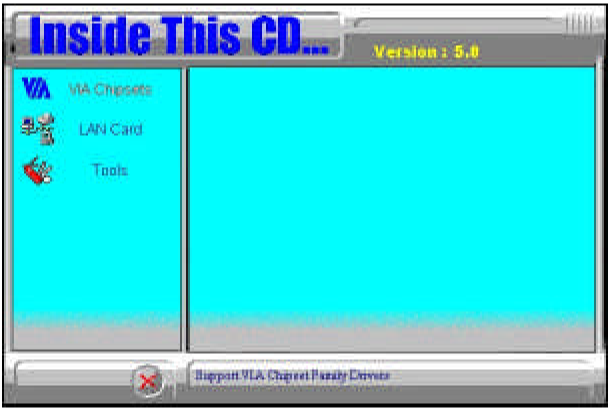
Drivers Installation

This section describes the installation procedures for software and drivers under the Windows 98, Windows NT 4.0 and Windows 2000. The software and drivers are included with the Embedded Board. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

VIA 4 in 1 Drivers Installation

Before installing the drivers for VGA, LAN and Audio, install the VIA 4 in 1 drivers first. Follow the instructions below to complete the installation.

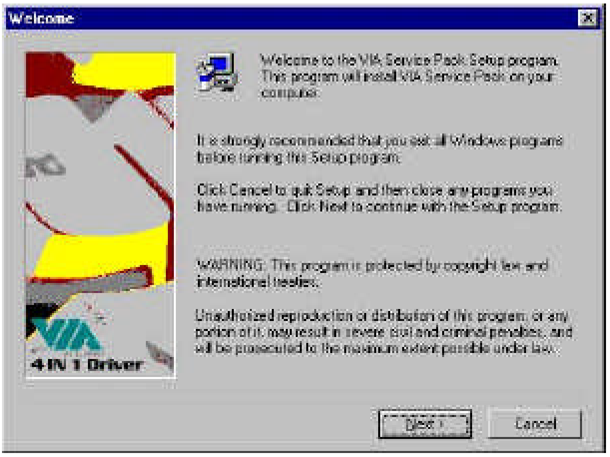
1. Insert the CD that comes with the Embedded Board and the screen below would appear. Click VIA Chipsets on the left side.



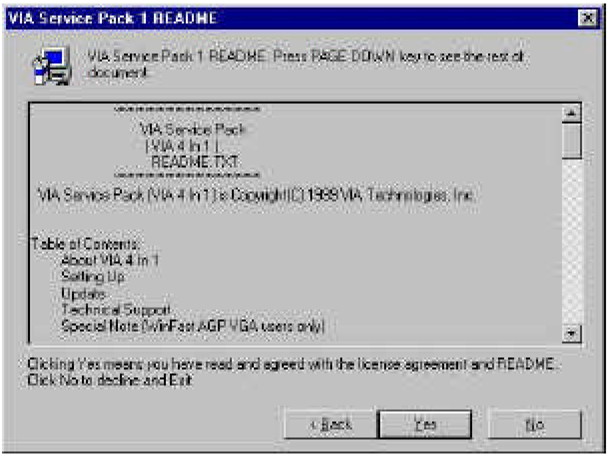
2. Click VIA 4 IN 1 Drivers.



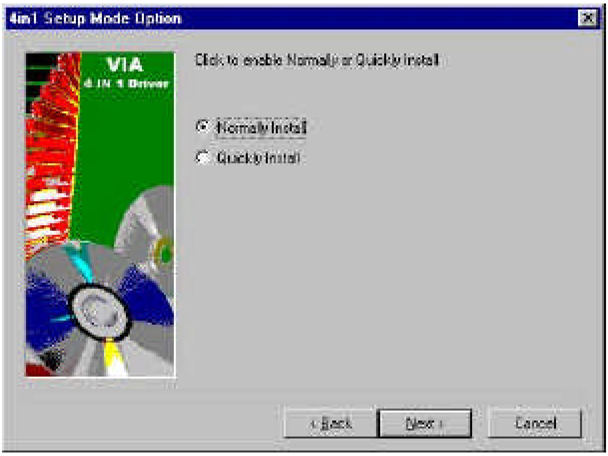
3. When the Welcome screen appears, click Next.



4. Click Next to agree with the license agreement statement and to continue.



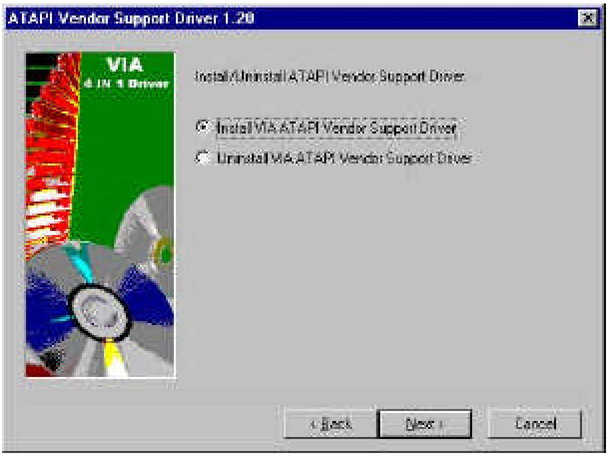
5. Select the Setup Mode and click Next to continue.



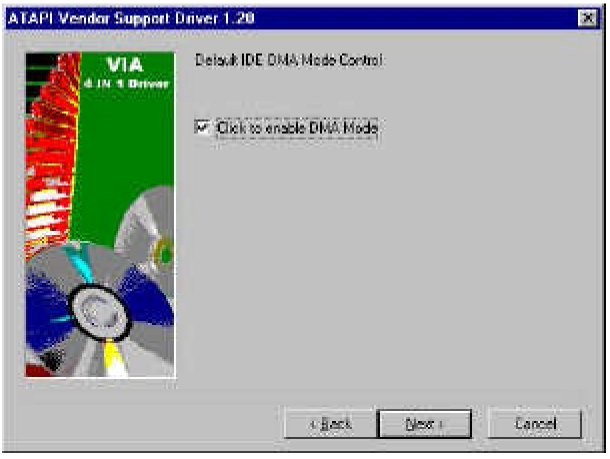
6. Click Next to install the drivers listed.



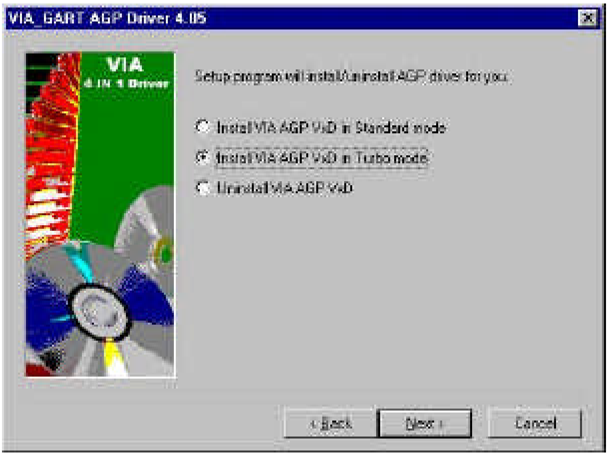
7. Click Next to install the VIA ATAPI Vendor Support Driver.



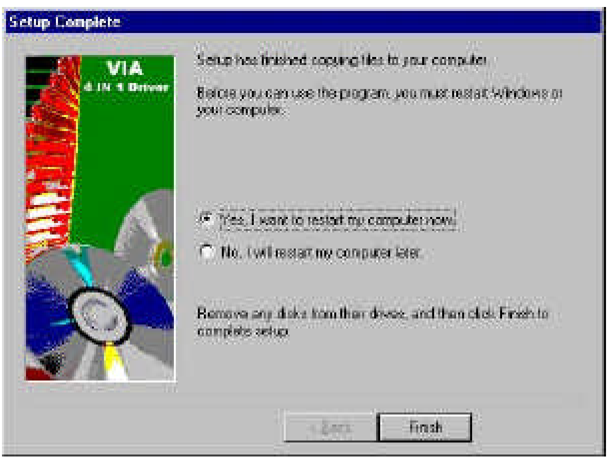
8. Click Next to enable DMA Mode.



9. Click Next to install the VIA AGP VxD in Turbo mode.



10. Click Finish to restart the computer and for changes to take effect.



VGA Drivers Installation

After installing the VIA 4 in 1 drivers, you may now install the VIA 8606 VGA Driver. Follow the steps below to proceed with the installation.

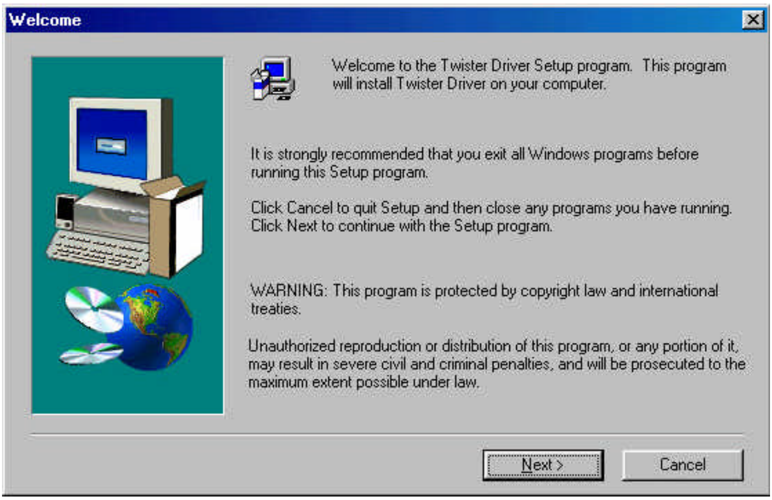
NOTE: Before installing the VGA drivers on Windows NT 4.0, you need to install Service Pack 3 or above.

1. Insert the CD that comes with the Embedded Board and the screen below would appear. Click VIA Chipsets on the left side.

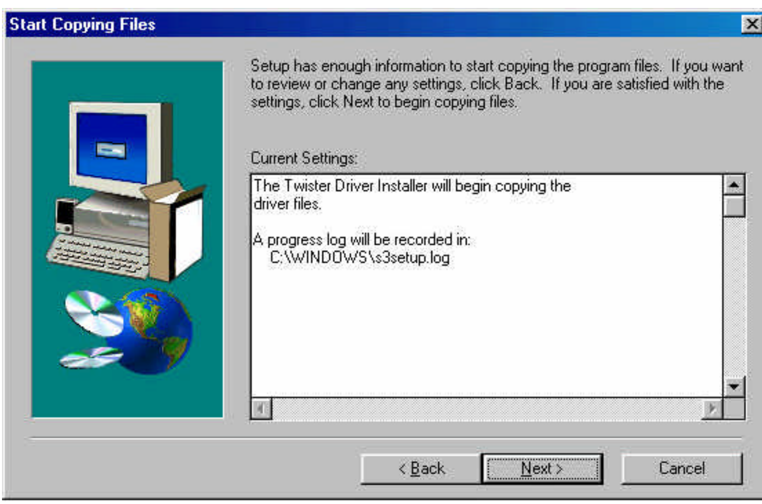
2. Click VIA 8606 VGA Driver.



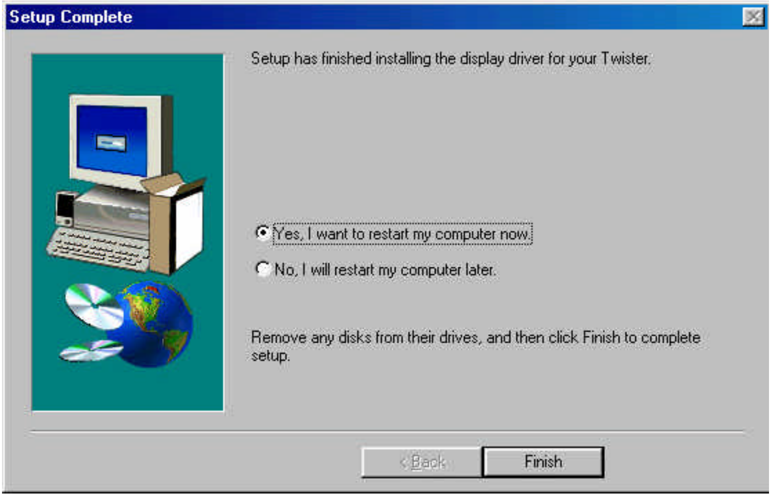
3. The welcome screen of the Twister Driver Setup will appear. Click Next to continue.



4. When the Start Copying Files screen appears, click Next to start copying the program files.



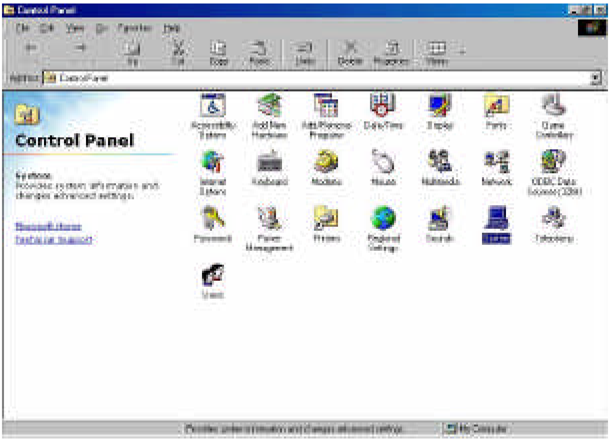
5. After file copying is done, the VGA driver installation is now completed. Click Finish to restart the computer and for changes to take effect.

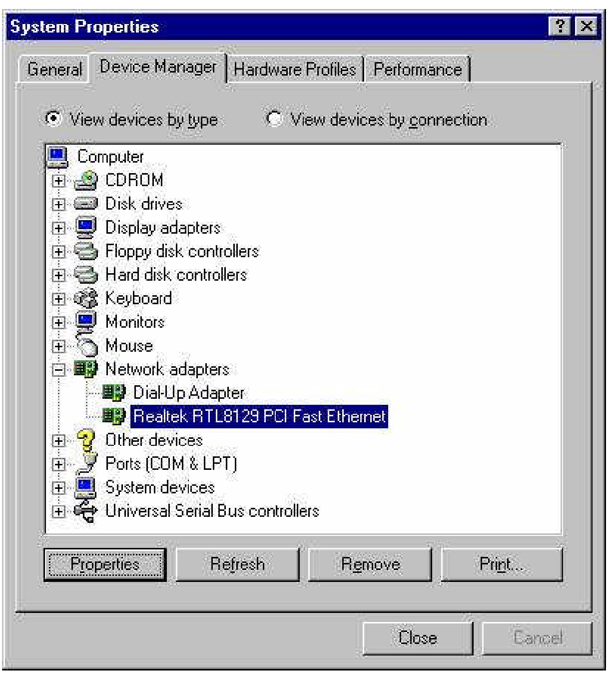


LAN Drivers Installation

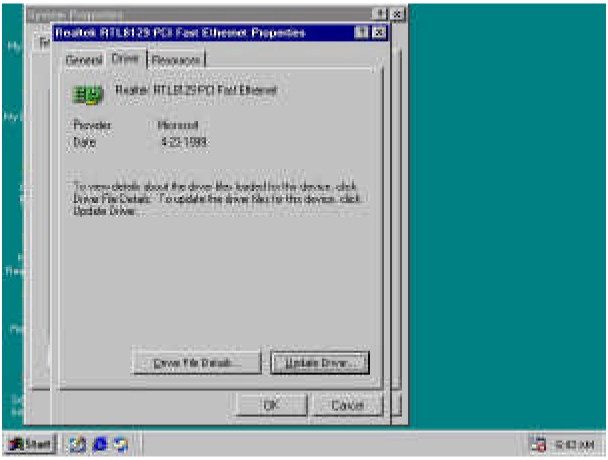
Follow the steps below to proceed with the LAN drivers installation.

1. In your Windows operating system, click Start → Settings → Control Panel → System Properties.

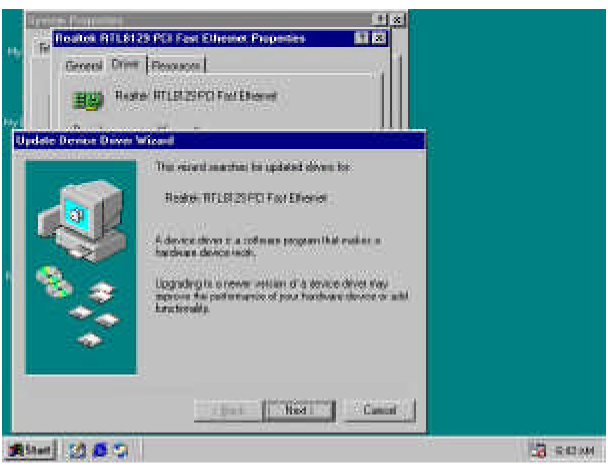




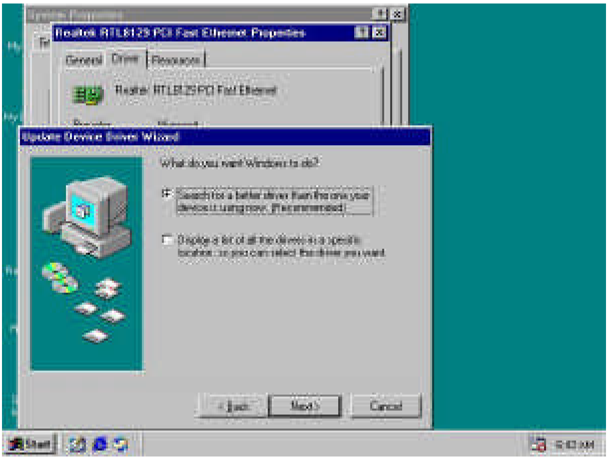
2. Under System Properties, click on the Device Manager tab. Double click on Realtek 8129 PCI Fast Ethernet. Click the Driver tab as shown. Now click the Update Driver button.



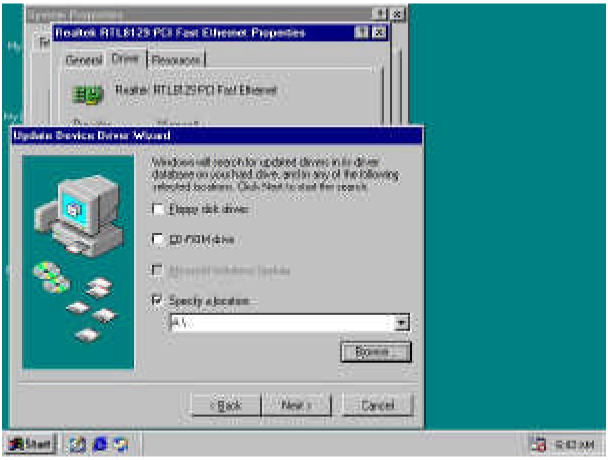
3. When the Update Device Drivers Wizard appears, click Next to continue.



4. Click Next to "Search for a better driver than the one your device is using now. (Recommended".



5. Click "Specify a location" and click Next to continue.

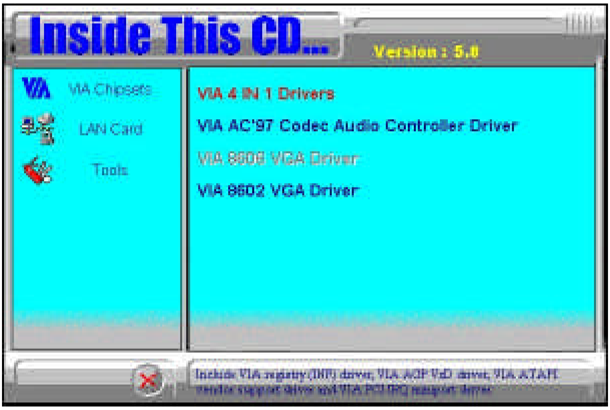


Audio Drivers Installation

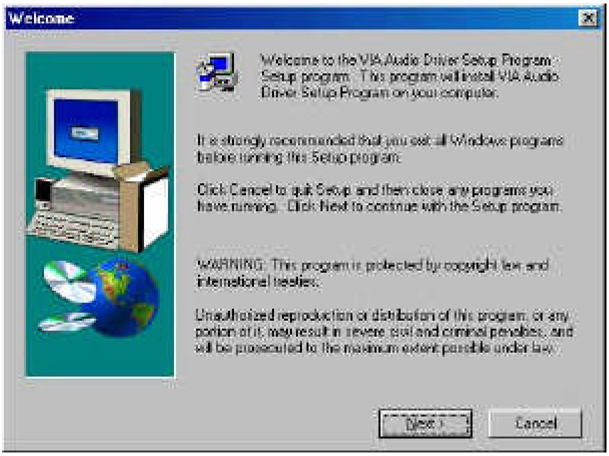
NOTE: Please install the VGA drivers before proceeding with the audio drivers installation.

Follow the steps below to proceed with the audio drivers installation.

1. Insert the CD that comes with the Embedded Board. Click on VIA Chipsets on the left and then click VIA AC' 97 Codec Audio Controller Driver.



2. Under the Welcome screen, click Next to agree with the license agreement statement and to continue.



Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses, which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Serial Port 3
IRQ11	Serial Port 4
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE

C. STN Flat Panel Data Outputs

Pin	STN8	STN16	STN24	DSTN8	DSNT16	DSTN24	DSTN16	DSTN24
FPD0	R0	R0	R0	LR0	LR0	LR0		LB3
FPD1	G0	G0	G0			LR3		LB2
FPD2	B0	B0	B0	LG0	LG0	LG0	LB1	LB1
FPD3	R1	R1	R1				LB0	LB0
FPD4	G1	G1	G1	LB0	LB0	LB0		UB3
FPD5	B1	B1	B1					UB2
FPD6	R2	R2	R2	LR1	LR1	LR1	UB1	UB1
FPD7	G2	G2	G2			LG3	UB0	UB0
FPD8		B2	B2		LG1	LG1		LG3
FPD9		R3	R3				LG2	LG2
FPD10		G3	G3		LB1	LB1	LG1	LG1
FPD11		B3	B3				LG0	LG0
FPD12		R4	R4		LR2	LR2		UG3
FPD13		G4	G4			LB3	UG2	UG2
FPD14		B4	B4		LG2	LG2	UG1	UG1
FPD15		R5	R5				UG0	UG0
FPD16			G5					LR3
FPD17			B5				LR2	LR2
FPD18			R6	UR0	UR0	UR0	LR1	LR1
FPD19			G6			UR3	LR0	LR0
FPD20			B6	UG0	UG0	UG0		UR3
FPD21			R7				UR2	UR2
FPD22			G7	UB0	UB0	UB0	UR1	UR1
FPD23			B7				UR0	UR0
FPD24				UR1	UR1	UR1		
FPD25						UG3		
FPD26					UG1	UG1		
FPD27								
FPD28					UB1	UB1		
FPD29						UB3		
FPD30					UR2	UR2		
FPD31								
FPD32					UG2	UG2		
FPD33								
FPD34								
FPD35								

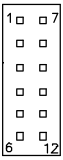
D. TFT Flat Panel Data Outputs

Pin	TFT9	TFT2x9	TFT12	TFT2x12	TFT15	TFT2x15	TFT18	TFT2x18	TFT24
FPD0								R00	R2
FPD1								R10	R0
FPD2					R0	R00	B0	R01	R3
FPD3						R10	B1	R11	
FPD4			R0	R00	R1	R01	B2	R02	R4
FPD5				R10		R11	B3	R12	
FPD6	R0	R00	R1	R01	R2	R02	B4	R03	R5
FPD7		R10		R11		R12	B5	R13	R1
FPD8	R1	R01	R2	R02	R3	R03		R04	R6
FPD9		R11		R12		R13		R14	
FPD10	R2	R02	R3	R03	R4	R04	G0	R05	R7
FPD11		R12		R13		R14	G1	R15	
FPD12							G2	G00	G2
FPD13							G3	G10	G0
FPD14					G0	G00	G4	G01	R3
FPD15						G10	G5	G11	
FPD16			G0	G00	G1	G01		G02	G4
FPD17				G10		G11		G12	
FPD18	G0	G00	G1	G01	G2	G02	R0	G03	G5
FPD19		G10		G11		G12	R1	G13	G1
FPD20	G1	G01	G2	G02	G3	G03	R2	G04	G6
FPD21		G11		G12		G13	R3	G14	
FPD22	G2	G02	G3	G03	G4	G04	R4	G05	G7
FPD23		G12		G13		G14	R5	G15	
FPD24								B00	B2
FPD25								B10	B0
FPD26					B0	B00		B01	B3
FPD27						B10		B11	
FPD28			B0	B00	B1	B01		B02	B4
FPD29				B10		B11		B12	
FPD30	B0	B00	B1	B01	B2	B02		B03	B5
FPD31		B10		B11		B12		B13	B1
FPD32	B1	B01	B2	B02	B3	B03		B04	B6
FPD33		B11		B12		B13		B14	
FPD34	B2	B02	B3	B03	B4	B04		B05	B7
FPD35		B12		B13		B14		B15	

E. About the Digital I/O

J18: Digital I/O Connector (4 in, 4 out)

This 12-pin Digital I/O connector supports TTL levels and is used to control external devices requiring ON/OFF circuitry.



Signal Name	Pin #	Pin #	Signal Name
In0	1	7	+5V
In1	2	8	Out0
In2	3	9	Ground
In3	4	10	Out1
Ground	5	11	+12V
Out2	6	12	Out3

SPECIFICATIONS:

Digital Input

Input channels: 4 bits
Input Voltage: High: 2.0V (min)
Low: 0.8V (max)
Input Load: High: 0.05mA max at 2.7V
Low: 0.4mA max at 0.5V
Register Address: 240H (Read)
Register Format: BIT: D3 D2 D1 D0
Value: IN3 IN2 IN1 IN0

Note: The input signal must be TTL compatible.

Digital Output

Output channels: 4 bits
Output voltage: High: Source -0.4mA at 2.4V min
Low: Sink 8mA at 0.5V max
Register Address: 240H (Write)
Register Format: BIT: D3 D2 D1 D0
Value: OUT3 OUT2 OUT1 OUT0